



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/081,127	02/22/2002	Steven Joseph King	ACUITY-029XX	8538

7590 04/12/2006

BOURQUE & ASSOCIATES, P.A.
Suite 301
835 Hanover Street
Manchester, NH 03104

EXAMINER

SETH, MANAV

ART UNIT	PAPER NUMBER
----------	--------------

2624

DATE MAILED: 04/12/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/081,127

Applicant(s)

KING, STEVEN JOSEPH

Examiner

Manav Seth

Art Unit

2624

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 February 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4, 7, 9-16, 18, 19 and 21-29 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4, 7, 9-16, 18, 19 and 21-29 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Response to Amendment

1. The amendment received on February 03, 2006 has been entered in full.
2. Applicant's amendment to the claims has been entered and based on the amendments 35 USC 112, 1st paragraph rejections on the respective claims have been withdrawn.
3. Applicant's arguments with respect to rejected claims as presented in the amendment filed have been fully considered but are moot in view of new ground(s) of rejection(s).

Claim Objections

4. Claims 9 and 21 are objected to because of the following informalities:

Claim 9 depends on a cancelled claim 8. Examiner for examining purposes considers claim 9 depending on claim 1.

Claim 21 depends on a cancelled claim 20. Examiner for examining purposes considers claim 21 depending on claim 15.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1, 2-4, 6, 9, 11-12, 15-16, 18, 21, 23-24, 28 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takeuchi et al., U.S. Patent No. 6,337,767, in further view of Kley, U.S. Patent No. 4,806,776 and further in view of Kubisiak et al., U.S. Patent No. 3,710,128.

Regarding claim 1, Takeuchi discloses illuminating a target (specimen) with at least a first visible light spectrum illumination source, taking a first image of the target using an image recording device, illuminating the target with at least a second ultraviolet illumination source, taking at least a second image of the target using said image recording device (col. 7, lines 20-30; col. 8, lines 1-36, images generated from the electrical signals for observation of the specimen (target) on the monitor (col.8, lines 24-25)). Takeuchi does teach taking images under different frequencies of light and then observing the specimen in the images on the monitor but does not expressly teach of processing said first image and at least a second image using a data processing device and extracting information of interest about the target. However, Kley discloses processing first and at least a second image using a data processing device and extracting information of interest (col. 37, lines 22-60; figures 81-100; col. 38, lines 47-60; In a variation illustrated in figure 83, a computer 1376 samples and processes the video signal from the television camera 1340 and displays processed video signals on monitor 1358. The computer 1376 is programmed to form differential images by digital techniques from successive frames of the video signal from television camera 1340. One particular application of the electronic illumination control employing oblique light units 1352 and 1354 to illuminate an object such as a printed circuit board 1378 is shown in fig. 84. The use of alternate light units wherein at least one of the units is oblique, produces differential images which contain information

regarding the height of the structures of the object in addition to the normal two-dimensional information concerning width and length of structure in the object being viewed). Therefore, it would have been obvious for one of ordinary skill in the art at the time of invention was made to combine the teachings of Takeuchi and Kley because both references are directed to the object (or target) observation under different light sources of different frequencies and both Takeuchi and Kley teaches the use of microscope to observe the specimen (or target) and Kley further provides the more versatility by teaching "that all of the variations and modifications of illumination control in connection with a microscope are also applicable to video systems or systems wherein an electronic signal is generated indicative of the object being viewed (col. 36, lines 20-28) and Kley further discloses illuminating the object (target) using different frequencies of illumination sources and utilizing the reflected illumination to determine the identity of a property (dimensional information, as discussed before) of the object (col. 42, lines 56-68) where apparently both visible and ultraviolet light sources can be used as they are light sources of different frequencies, therefore providing the versatile usage of using light sources of different frequencies in the inspection of object's properties and Kley's invention provides the possible versatile use (application) of the teachings provided by Takeuchi.

As discussed above the combined invention of Takeuchi and Kley discloses determining the dimensional information of the object from the information extracted from the object images but does not expressly teach "comprising the determination of an edge of at least a portion of the target". It is clear from the above disclosure by Kley, that Kley determines width and length of the object and as well known these do parameters totally identify the edges of the object. However, Kubisiak discloses determining an edge of the object from the image signals where the object being illuminated using two different light sources (col. 9, lines 59-68 through col. 10, lines 1-16; col. 2,

Art Unit: 2624

lines 47-55; col. 3, lines 35-65; col. 4, lines 43-68 through col. 5, lines 1-40). Therefore it would have been obvious for one of ordinary skill in the art at the time of invention was to use Kubisiak's teachings in the combined invention of Takeuchi and Kley because the references are directed to measuring the dimensions of the object under different illumination sources and Kubisiak's method of determining edge of the object would provide a better accuracy (See Kubisiak, col. 2, lines 35-46).

Regarding claims 2-4, as discussed in the rejection of claim Kley discloses "In a variation illustrated in figure 83, a computer 1376 samples and processes the video signal from the television camera 1340 and displays processed video signals on monitor 1358. The computer 1376 is programmed to form differential images by digital techniques from successive frames of the video signal from television camera 1340" (col. 37, lines 22-60; figures 81-100; col. 38, lines 47-60).

Claim 6 recites "the method of claim 3 wherein processing said first and at least a second image using a data processing device comprises superpositioning of the first image and the second image". Kubisiak discloses superpositioning of the two image signals (col. 4, lines 43-68 through col. 5, lines 1-40).

Regarding claim 9, Takeuchi discloses the act of providing a filter disposed between the target and the at least a second illumination source to block visible light. (Figure 5; col. 8, lines 11-13, "under ultraviolet ray observation with DUV light, **the illumination light becomes only ultraviolet light by UV filter 151**").

Claim 11 recites “the method of claim 1 further comprising the act of providing a filter disposed between the camera and the target”. Kley discloses “In alternative embodiments the color control unit 1446 can have additional frequency **band pass filters**, or can have band pass filters for non-visible frequencies such as infrared or ultraviolet light **where the camera 1340 is sensitive to such radiations (col. 39, lines 22-30)**. The instant invention **recites the use** of well-known band pass filters to block a particular spectrum of light, not the design of these band pass filters. The use of band pass filters is very well known to be used to in front of cameras and light sources to block a particular spectrum of frequencies and it depends on user’s specific design choice of selecting the band pass filter depending on what frequency band to be blocked and what needs to be passed on. Also, Takeuchi discloses the same in figures 2 and 5.

Claims 12 has been similarly analyzed and rejected as per claim 11.

Claims 15 and 16 have been similarly analyzed and rejected as per claims 1-4.

Claim 18 has been similarly analyzed and rejected as per claim 6.

Claim 21 has been similarly analyzed and rejected as per claim 9.

Claims 23-24 have been similarly analyzed and rejected as per claims 11, 12 and 15.

Regarding claim 28, However, Takeuchi teaches such a filter which blocks visible light, and a filter which blocks ultraviolet light disposed between the imaging device and target (col. 3, lines 25-

Art Unit: 2624

35; col. 8, lines 1-26). All other limitations of claim 28 have been similarly analyzed and rejected as per claims 1-4.

Claim 29 has been similarly analyzed and rejected as per claims 1-4 and 11-12.

7. Claims 1, 15, 28 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takeuchi et al., U.S. Patent No. 6,337,767, in further view of Kley, U.S. Patent No. 4,806,776, and further in view of Ausschnitt et al., U.S. Patent No. 5,914,784.

Regarding claims 1, 15, 28 and 29, Takeuchi discloses illuminating a target (specimen) with at least a first visible light spectrum illumination source, taking a first image of the target using an image recording device, illuminating the target with at least a second ultraviolet illumination source, taking at least a second image of the target using said image recording device (col. 7, lines 20-30; col. 8, lines 1-36, images generated from the electrical signals for observation of the specimen (target) on the monitor (col.8, lines 24-25)). Takeuchi does teach taking images under different frequencies of light and then observing the specimen in the images on the monitor but does not expressly teach of processing said first image and at least a second image using a data processing device and extracting information of interest about the target. However, Kley discloses processing first and at least a second image using a data processing device and extracting information of interest (col. 37, lines 22-60; figures 81-100; col. 38, lines 47-60; In a variation illustrated in figure 83, a computer 1376 samples and processes the video signal from the television camera 1340 and displays processed video signals on monitor 1358. The computer 1376 is programmed to form differential images by digital techniques from successive frames of the video signal from television camera 1340. One particular application of the electronic illumination control

employing oblique light units 1352 and 1354 to illuminate an object such as a printed circuit board 1378 is shown in fig. 84. The use of alternate light units wherein at least one of the units is oblique, produces differential images which contain information regarding the height of the structures of the object in addition to the normal two-dimensional information concerning width and length of structure in the object being viewed). Therefore, it would have been obvious for one of ordinary skill in the art at the time of invention was made to combine the teachings of Takeuchi and Kley because both references are directed to the object (or target) observation under different light sources of different frequencies and both Takeuchi and Kley teaches the use of microscope to observe the specimen (or target) and Kley further provides the more versatility by teaching "that all of the variations and modifications of illumination control in connection with a microscope are also applicable to video systems or systems wherein an electronic signal is generated indicative of the object being viewed (col. 36, lines 20-28) and Kley further discloses illuminating the object (target) using different frequencies of illumination sources and utilizing the reflected illumination to determine the identity of a property (dimensional information, as discussed before) of the object (col. 42, lines 56-68) where apparently both visible and ultraviolet light sources can be used as they are light sources of different frequencies, therefore providing the versatile usage of using light sources of different frequencies in the inspection of object's properties and Kley's invention provides the possible versatile use (application) of the teachings provided by Takeuchi.

As discussed above the combined invention of Takeuchi and Kley discloses determining the dimensional information of the object from the information extracted from the object images but does not expressly teach "comprising the determination of an edge of at least a portion of the target". It is clear from the above disclosure by Kley, that Kley determines width and length of the object and as well known these do parameters totally identify the edges of the object. However,

Ausschnitt discloses “determination of the location of the object edge may include comparing the image signal profiles of the object edge at the different phases or different light colors” (col. 3, lines 47-50) where different color light belong to different light frequencies. Therefore, it would have been obvious for one of ordinary skill in the art at the time invention was made to use Ausschnitt’s teachings in the combined invention of Takeuchi and Kley because the references teach evaluation of the object under different lighting conditions. Kley does teach measuring the dimensions of the object and Ausschnitt’s teaching’s further provide the improved method of detecting and measuring edges of features which would produce sharper edges (See Ausschnitt, col. 3, lines 2-6).

8. Claims 7, 19 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takeuchi et al., U.S. Patent No. 6,337,767, in further view of Kley, U.S. Patent No. 4,806,776 and further in view of Kubisiak et al., U.S. Patent No. 3,710,128, and further in view of a printed article from Archive.org, 2000, “Nerlite DOAL and COAL Illuminators” (here Nerlite) (pp. 1-3).

Regarding claims 7 and 19, Claims 7 and 19 recites “the first illumination source comprises using a diffuse on-axis light source”. As discussed in the rejection of claim 1, Kley suggests of using different kinds of light sources and examiner further asserts that “diffuse on-axis light source” (DOAL) is very well-known to be used for illumination purposes. Examiner took official notice for this well known light source and here by provides the reference (Nerlite from archive.org) which further provides motivations to use DOAL, by teaching “With the DOAL’s illumination, light rays reflect off a beam splitter on to an object at nearly 90 degrees and further providing uniform light output eliminating glare and shadows and this provides standard use of DOAL in applications that involve the inspection of objects with reflective surfaces” (Nerlite, pages 1-3). Therefore, in view of the above cited advantages of DOAL with respect to reference Nerlite, it

would have been obvious for one of ordinary skill in the art at the time of invention was made to use DOAL in the combined invention of Takeuchi, Kley and Kubisiak.

Claim 27 has been similarly analyzed and rejected as per claims 1-4 and 7.

9. Claims 10 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takeuchi et al., U.S. Patent No. 6,337,767, in further view of Kley, U.S. Patent No. 4,806,776 and further in view of Kubisiak et al., U.S. Patent No. 3,710,128, and further in view of Murnaghan Instruments (hereinafter **Murnaghan**), 1999, "UV35 Ultraviolet Passing – Visible blocking CCD filter".

Claim 10 recites "the method of claim 9 wherein the filter blocks wavelengths of lights greater than 390 nanometers". Kley does not teach a filter that blocks wavelengths of light greater than 390 nanometers. Ultraviolet pass camera filters are general service filters that block ultraviolet light, which can cause a hazy look, and serve to protect more expensive lenses. However, Murnaghan does teach a filter, that blocks wavelengths of light greater than 390 nanometers (page 2, line 1, "Transmittance ends: 390nm"). Therefore, it would have been obvious for one of ordinary skill in the art to use Murnaghan's filter in the invention of Kley as it would block visible spectrum and despite of the fact where it is used would block visible spectrum and pass ultraviolet light.

Claim 22 has been similarly analyzed and rejected as per claims 10 and 21.

10. Claims 13-14 and 25-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takeuchi et al., U.S. Patent No. 6,337,767, in further view of Kley, U.S. Patent No. 4,806,776 and

further in view of Kubisiak et al., U.S. Patent No. 3,710,128, and further in view of **Schneider Optics**, 1999, "Filters for Motion pictures and television".

Claim 13 recites "the method of claim 12 wherein the filter blocks light less than 410 nanometers". As discussed in claim 11, both Takeuchi and Kley does teach blocking ultraviolet light but does not specifically teach blocking light less than 410 nanometers. It is well known that ultraviolet light and visible light are part of the light spectrum where ultraviolet light range starts from 400nm and goes lower and visible light range starts at 400nm to 700nm. The violet color in the visible range lies at the intersection of 400nm and practically between 390nm and 410nm such that violet being a part of ultraviolet as well as visible range. Therefore, taking this concept in consideration, inventors have been using band pass filters that completely blocks ultraviolet light which is less than 410 nanometers where specifically and completely blocking only visible light which is greater than 390nm where specifically ultraviolet based imaging is required, for better accuracy of images. Schneider further teaches such a ultraviolet blocking filter UV-410 which filters out ultraviolet light below 410nm (page 20, lower right hand corner). Therefore, it would have been obvious for one of ordinary skill in the art to use Schneider's ultraviolet filter in the invention of Kley as Schneider's filter would filter out ultraviolet light below 410 nm, blocks the blue cast, penetrates haze and permits to capture vivid colors and shaper detail.

Claim 14 recites "the method of claim 13 wherein the filter blocks at least one portion of the visible light spectrum". Claim 14 has been similarly analyzed and rejected as per claim 13.

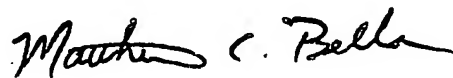
Claims 25 and 26 have been similarly analyzed and rejected as per claims 13-15 and 23.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Manav Seth whose telephone number is (571) 272-7456. The examiner can normally be reached on Monday to Friday from 8:30 am to 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bhavesh Mehta, can be reached on (571) 272-7453. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Manav Seth
Art Unit 2625
April 4, 2006

MATTHEW C. BELLA
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600